Compostable Material Facilities

Compliance First: Evaluation of Solid Waste Facilities' State Standards

Training Provided By:

California Integrated Waste Management Board (CIWMB)

Introduction

Compost facilities receive non-hazardous organic waste materials such as green material and food waste for the purpose of allowing biological decomposition of these wastes. The end product – compost – is biologically stable and most weed seeds have been rendered non-viable.

A Multi-step Process

A violation may be issued if the operational activates observed during an inspection do not correspond to what is described in the RCSI:

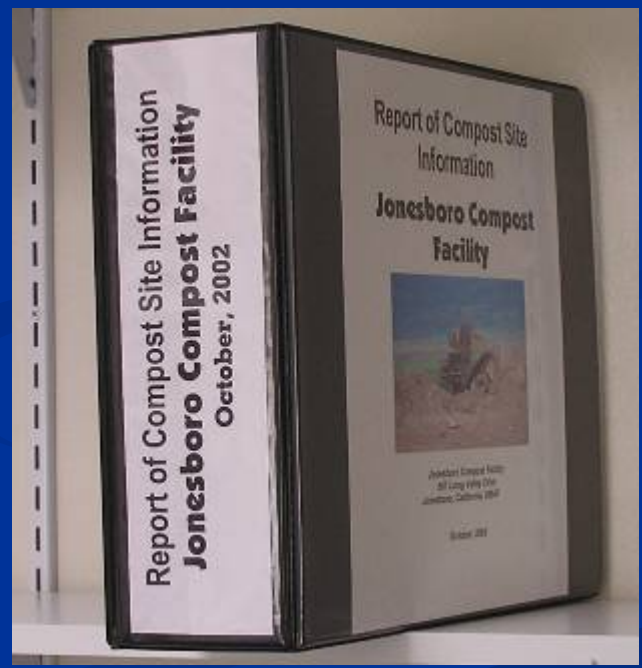
1) Receiving
2) Processing
3) Composting
4) Storing
5) Shipping

Top Violations

- *T14 17863* *Report of composting site information*
- *T14 17863.4* *Odor impact minimization plan*
- *T14 17867(a)(5)* *Unauthorized access*
- *T14 17867(a)(8)* *Fire prevention*
- *T14 17867.5* *Personnel training*
- *T14 17869(a)* *Inspection of records*
- *T14 17869(b)* *Special occurrences*
- *T14 17869(h)* *Training records*

Report of Composting Site Information
14 CCR §17863

- *Each operator of a compostable material handling facility that is required to obtain a "Compostable Materials Handling Facility Permit," as specified in Article 2 of this Chapter, shall, at the time of application, file a Report of Composting Site Information with the EA*



What Triggers a Violation?

- The most common problem is that the RCSI does not adequately describe the current operations. Common topics include:
  - Feedstock changes
  - Methods for composting
  - Hours of operation
  - Others?

Odor Impact Minimization Plan

14 CCR §17863.4

- *(a) All compostable material handling operations and facilities shall prepare, implement and maintain a site-specific odor impact minimization plan. A complete plan shall be submitted to the EA with the EA Notification or permit application.*

The Plan Must Include:

- *(b) Odor impact minimization plans shall provide guidance to on-site operation personnel by describing, at a minimum, the following items. If the operator will not be implementing any of these procedures, the plan shall explain why it is not necessary.*
  - *Odor monitoring protocol*
  - *Description of meteorological conditions*
  - *Complaint response protocol*
  - *Design and operational methods for minimizing odor*
  - *Description of operating procedures to reduce odor*

The Plan Must Also:

- Reflect any changes and notify EA within 30 days
- Be reviewed annually by the operator
- Be reviewed by the EA to affirm compliance
- Be added to by the EA if odor impacts are still occurring

Odor – A Subjective Issue

- All compost facilities produce odor. When is it normal and when does it become a problem?
  - Number of complaints
  - Validity of complaints
  - Discussion

Sources of Compost Facility Odors

- Inbound feedstock
- Unprocessed feedstock stockpiles
- Grinding or screening operation
- Active compost area (turning piles)
- Standing water

Odor Source Location	Possible Cause	Management Approach
Feedstock Receiving	Material exceptionally odorous upon receipt	Add carbon source at grinding and “nibble” at odorous pile
	Odorous material remaining unprocessed on receiving pad (mix sitting too long prior to processing)	Augment material processing efforts
Aisles / Access Roads	Storm water allowed to pond in improperly graded areas	Absorb ponded water with wood chips/other absorbent, fill depressions, improve grading and/or drainage control
	Unprocessed material in aisles	Clean aisles of spilled material and treat with carbon source
Stockpiles / Windrows	Ammonia odor (high nitrogen level)	Add additional wood chips (or other carbon source), recombine pile
	Sulfur Odor (anaerobic conditions)	Increase turning frequency, check temperatures, add bulking agent
	Varying odors in pile	Turn windrows to achieve even mixing, check temperatures, porosity, fiber-length, bulk density, and moisture content, adjust windrow constituents, geometry, and/or configuration
	Odors generated after turning	Increase turning frequency, increase pile porosity, add odor-absorbing amendment (like wood chips, sawdust, wood ash)
	Long retention time	Remove chipped and ground material more frequently
Curing Piles / Product Storage Areas	Odors present at time of loading (temperatures above 122°F)	Decrease pile size, increase windrow time prior to moving to curing piles or product storage

Other MSW Facility Odors
Could Impact the Compost Facility

- Apply to compost facilities that are located at landfills or transfer stations:
  - Active face
  - Exposed waste
  - Area of poor drainage
  - Landfill gas
  - Leachate
  - Cleaning the pit

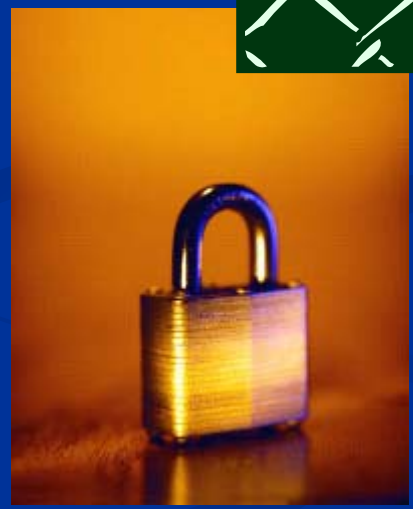
What Triggers a Violation?

- An inadequate plan may trigger a violation regardless of whether or not there are odors.
- An inspector may issue a violation if the Odor Impact Minimization Plan is inadequate.

Unauthorized Access
14 CCR § Section 17867(a) (5)

- *(5) Unauthorized human or animal access to the facility shall be prevented.*

- The goal is to keep people and animals out so that they aren't exposed to dangers (i.e., pathogens or temps) or don't cause safety problems.

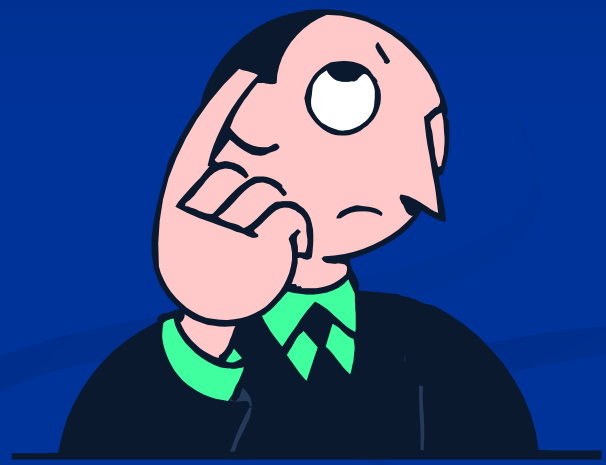


When is it Secure?

- When is a facility considered secure enough to satisfy the requirement?
- How sensitive is the facility to an intruder?
- What do you think about this facility?

Consider the History

- Consider the facility's history when evaluating the security of the facility.
- Have there been problems related to a lack of security?
- If so, what are some practical solutions?



Example

- Is the fence appropriate and is it intact?
- Or are we attracting “outsiders” by not managing the facility properly?

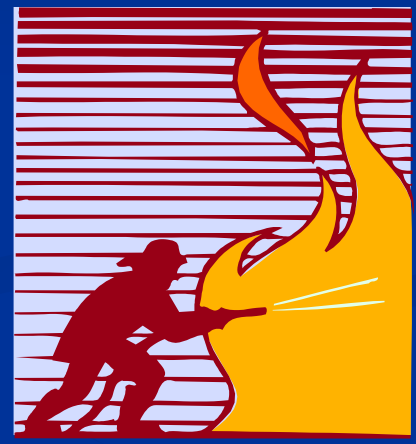
What Triggers a Violation?

- A facility with no fencing or lockable gate that would allow unauthorized access would be considered in violation.

Fire Prevention, Protection & Control

14 CCR § Section 17867(a) (8)

- *(8) The operator shall provide fire prevention, protection and control measures, including, but not limited to, temperature monitoring of windrows and piles, adequate water supply for fire suppression, and the isolation of potential ignition sources from combustible materials. Firelanes shall be provided to allow fire control equipment access to all operation areas.*



Fire Marshal Meetings

The CIWMB and the State Fire Marshall are sponsoring regional coordination meetings in November, 2005 to better prevent and suppress solid waste fires.

For more information:

http://www.ciwmb.ca.gov/LEACentral/Fires/default.htm

Ignition Sources

- Smoking
- Arson
- Chemical reaction
- Spontaneous combustion
- Wildfire
- Lightning
- …any others?

- **Equipment fire**
  - **Spark from machine**
  - **Electrical short**
  - **Poor housekeeping**
  - **Flammable liquid**

High Fire Risk

As raw material enters the facility, it may be stockpiled. This is one of the most vulnerable locations due to the risk of spontaneous combustion.

Heterogeneous materials that may provide adequate porosity and wet/dry interface are especially at risk.

Spontaneous Combustion

When a fire starts without any external source of ignition

Avoiding the Risk of Spontaneous Combustion

- Minimize bulk pile size
- Avoid prolonged storage of bulk materials
- Provide adequate separation between piles or underlying landfill
- Monitor compost piles for temperature and turn as necessary
- Be aware of heterogeneous nature of raw material (wet-dry interface)

Fire Prevention:
Green Material

- Minimize green material pile size and provide adequate cleared space around pile
- Monitor temperature of compost piles (upper 1/3)

Temperature Thresholds

Temperature Thresholds for Compostable Materials	
Temperature	Explanation
122°F*	When materials reach this temperature, CIWMB will regulate as composting facility.
131°F*	Minimum temperature for Pathogen reduction.
140°Fα	Very active composting – monitor temps frequently
160°Fα	Generally time to add water and/or turn pile
170°Fα	Biological activity slows as microbes die or go dormant
180°Fα	Chemical oxidation has taken over. Temps can elevate rapidly
180°F and aboveα	Evaporation accelerates. Pile is on its way to spontaneous combustion
300°Fα	Active fire

Regulatory threshold
αApproximated threshold

Ignition Temperature

Ignition temperature . . .

the temperature at which more heat is generated by combustion than is lost to the surroundings, so that the combustion process becomes self-sustaining (Energy Technology Handbook, Considine).

The ignition temperature for most organic materials is 205 to 400°F (96 to 205°C).

Fire Prevention

Prevention of Fires

- Allow pile heat dissipation by keeping pile height below 2 1/2-meters (8-9 feet)
- Keep pile moisture above 40%, and
- Keep moisture uniformly distributed

Monitor pile temperature!

Site Design

Fires: Site Design Implications

- **Provide enough space to avoid exceeding the fire-safe height of piles.**
- **Provide access to piles for fire fighting equipment (full perimeter access).**
- **Provide access to adequate supply of water.**
- **Provide space to spread piles out.**

High Risk Conditions

Feedstocks and Conditions Most Susceptible to Pile Fires

- Raw, green feedstocks that may have already begun decomposing, such as a large brush pile.
- Bark chips if given enough moisture to start biological activity.
- Large piles of coarse compost, feedstock and screened over-sized material (particle size ~4”), such as bulking material, wood chips and mulch products.

What Triggers a Violation?

This is what the LEA is looking for:

- Adequate fire protection
- Regular temperature monitoring
- Good access for fire fighting equipment
- Adequate water supply
- Room to isolate a fire if it occurs

Personnel Training
14 CCR § Section 17867.5

- *(1) Operators shall ensure that all personnel assigned to the operation shall be trained in subjects pertinent to operations and maintenance, including the requirements of this article, physical contaminants and hazardous materials recognition and screening, with emphasis on odor impact management and emergency procedures. A record of such training shall be maintained on the site.*

Training Elements

- Operations
- Maintenance
- Physical contaminants
- Haz-mat recognition and screening
- Odor impact management
- Emergency procedures
- How far should an inspector go in affirming that this type of training is occurring?

Training Verification

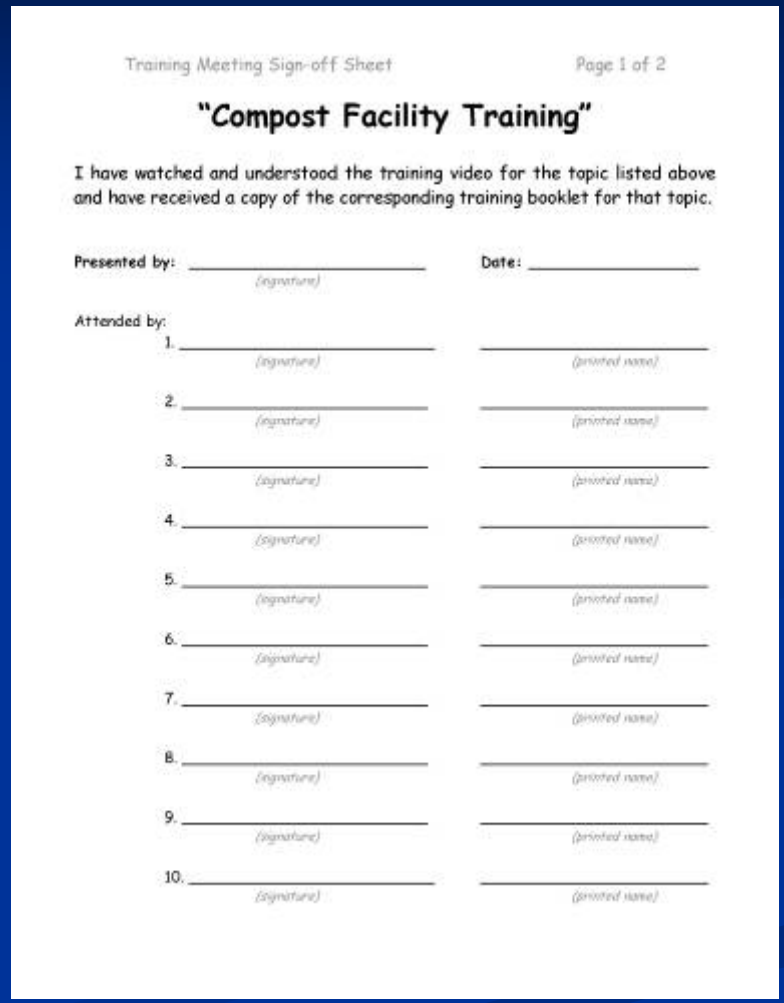
- What are some things an inspector should look for to verify that the training is adequate?
  - Training records
  - Results
    - Is operation functional?
    - Are physical contaminants handled?
    - Is load check program effective?
    - Does crew understand emergency response plan?
    - Are odors controlled
  - Anything else?

What Triggers a Violation?

- Here are some things that will trigger a violation:
  - Inadequate training
  - Inadequate training records
  - Training records not available

Training Documentation

- Documentation can be as simple as placing a copy of specific training materials, along with an employee sign-off sheet, into a training file.



Training Meeting Sign-off Sheet Page 1 of 2

"Compost Facility Training"

I have watched and understood the training video for the topic listed above and have received a copy of the corresponding training booklet for that topic.

Presented by: _____ (signature) Date: _____

Attended by:

1. _____ (signature) _____ (printed name)
2. _____ (signature) _____ (printed name)
3. _____ (signature) _____ (printed name)
4. _____ (signature) _____ (printed name)
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Inspection of Records
14 CCR §Section 17869

- *(a) All records required by this Chapter shall be kept in one location and accessible for five (5) years and shall be available for inspection by authorized representatives of the board, EA, local health entity, and other duly authorized regulatory and EAs during normal working hours.*

- *What issues can make it difficult for a facility to comply with this requirement?*

Some Common Problems

- No Files …all discarded
- No Filing System
- Chaotic Filing System
- Files not on-site

Some Common Problems

- Archived files that are unorganized present a real challenge. Is it there …or not?

What Triggers a Violation?

- Inadequate records
- Records not available
- Records not on-site

Special Occurrences
14 CCR §Section 17869(b)

- *(b) The operator shall record any special occurrences encountered during operation and methods used to resolve problems arising from these events, including details of all incidents that required implementing emergency procedures.*

Special Occurrences

- Special occurrences include:
  - Accidents
  - Fires
  - Injuries
  - Fatalities
  - Spills
  - Other?

What Triggers a Violation?

- No special occurrence log
- Special occurrences not recorded
- Records of special occurrences not available

Training Records
14 CCR §Section 17869

- *(h) The operator shall retain a record of training and instruction completed in accordance with section 17867.5.*

What Triggers a Violation?

- No training records
- Records not available

Virtual Inspection

- A variety of photos taken at compost facilities are shown on the following pages.
- Do you see any problems?

Virtual Inspection Photo 1

- Compost drainage …any problem?

Virtual Inspection Photo 2

- *Excess water flowing from ag-bag compost operation …any problem?*


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Virtual Inspection Photo 3

- *Finished compost product …any problem?*

Virtual Inspection Photo 4

- *Compost windrows with identifying numbers …any problem?*

Virtual Inspection Photo 5

- *Compost windrows …any problem?*

Virtual Inspection Photo 6

- *Processing green material with a tub grinder …any problems?*

Wrap up Questions?

- Any questions on compostable materials facilities?
- How about some examples of what you see out there in the real world?